

REMARKS/ARGUMENTS

The Office Action of March 22, 2005 has been reviewed and considered. Independent claims 21, 29, 35, 38, and 42 have been amended to recite that the layers are deposited by CVD. Reconsideration of the application is requested.

Claims 21, 29, 32, 35, 38-42 stand rejected under 35 U.S.C. §102(e) as anticipated by Overstreet (5,954,147). Overstreet does not teach each and every element of the instant claims as required by 35 USC 102.

The instant claims are directed to a coated tool for machining or a method of producing a tool substrate. Examples of such tools are given on page 3, third paragraph of the instant application. A tool for machining is used to shape a material (metal) by removing chips. The instant claims require two carbon layers with each carbon layer deposited by CVD (chemical vapor deposition).

Overstreet does not teach a tool for machining. Instead, the tool disclosed in Overstreet is an earth boring bit. This bit has a number of cutting elements, which have a wear-resistant surface of nanocrystalline diamond. An earth boring bit is used for "crushing", "scraping", or "shearing" as set forth in column 2, first paragraph. The structure of the cutting element according to Overstreet is different from the claimed layer structure.

Overstreet's preferred type of layer is PDC (polycrystalline diamond compact (column 1, line 27)). Using PDC technology, cutting elements are formed from nanocrystalline diamond material as explained on column 5, line 38 - column 6, line 6. Under high pressure and temperature, carbon and a *binder* metal (such as cobalt, nickel or iron) are *sintered*. Overstreet mentions a CVD deposited diamond having nanocrystalline structure (column 6, line 47 - column 7, line 20), but only in the context of a single layer.

The Office Action refers to column 7, lines 20-34, of Overstreet. In this paragraph, Overstreet suggests various techniques, including:

1) "the treating of a vapor coated insert in an HPHT apparatus to improve bonding." This passage refers to the formation of a single CVD layer and clearly does not teach or suggest the specific two layer structure according to the instant claims wherein each layer has a different diamond crystal structure.

2) "sintering of nanocrystalline powder in an HPHT apparatus directly to the carbide element." This passage also refers to a single layer wherein the layer is a *sintered* nanocrystalline diamond powder, not CVD deposited layers as claimed.

3) "layering of the nanocrystalline diamond on the surface with a conventional PDC layer underneath and between the nanocrystalline diamond and the carbide to create an especially wear-resistant surface and a courser, tougher intermediate diamond layer." Conventional PDC layer is different from the claimed CVD deposited carbon layer as discussed above. The PDC layer requires a binder. This does not teach or suggest the specific two layer structure according to the instant claims wherein each layer is CVD deposited and each has a different diamond crystal structure.

4) "vapor coating of a PDC coated insert with a nanocrystalline diamond film" Again, a PDC layer is described, not CVD deposited layers as claimed.

Thus, although Overstreet mentions applying nanocrystalline diamond layers by CVD, Overstreet does not teach, suggest, or recognize the application of two CVD layers in accordance with the instant claims. Moreover, Overstreet emphasizes PDC layers and prefers these layers for its earth boring bit. In view of Overstreet, one skilled in the art would have had no motivation to provide two distinct CVD deposited carbon layers for a machine tool as claimed.

There are significant differences between the CVD deposited carbon layers as claimed and PDC layers according to Overstreet. For example, the claimed CVD deposited carbon layers are made with carbon and no binder. The PDC layers require a binder.

Further, in regard to claims 21, 29, and 38, the second carbon layer has a coefficient of thermal expansion that is greater than the coefficient of thermal expansion of the first carbon layer. As explained in the specification (page 5, second paragraph), this leads to the second carbon layer exerting an additional compressive stress on the first carbon layer, so that cracks can no longer reach the substrate.

Overstreet does not teach or discuss coefficient of thermal expansion of its layers and is completely silent regarding the thermal behavior of its compact material. There is no reason one skilled in the art would have considered Overstreet's layers to have the coefficients of thermal expansion as claimed, and no reasons are provided why the claimed coefficients of thermal

expansion are inherent. Moreover, Overstreet describes (and prefers) PDC layers. These layers contain a binder material. The thermal coefficient of expansion is not relevant to PDC layers and hence cannot be an "inherent" limitation. Withdrawal of the rejection is requested.

Claims 22-28, 30, 31, 36, 37 stand rejected under 35 U.S.C. §103(a) as unpatentable over Overstreet. Overstreet does not teach or suggest the claimed invention for the reasons discussed above. Moreover, there is no reason that one skilled in the art would have modified the earth boring bit to form a machining tool having the claimed layer structure as an earth boring bit would require different properties than machine tools. Withdrawal of the rejections is requested.

CONCLUSION

For all of the above-discussed reasons, Applicants respectfully submit that claims 21-42 are allowable and that the application is now in condition for allowance. A notice to this effect is earnestly solicited.

If any questions or issues remain, the resolution of which the Examiner feels would be advanced by a conference with Applicants' attorney, the Examiner is invited to contact Applicants' attorney at the number noted below.

If any fees are required with this submission, the Commissioner is authorized to charge such fees to deposit account No. 19-0733.

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